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I further certify that the name of the applicant has been amended to LEISURETECH ELECTRONICS PTY LIMITED pursuant to the provisions of Section 104 of the Patents Act 1990.

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A handwritten signature in cursive script, appearing to read "Kim Marshall".

KIM MARSHALL
MANAGER EXAMINATION SUPPORT AND
SALES



AUSTRALIA

Patents Act 1990



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PROVISIONAL SPECIFICATION

Invention Title:

A distributed stereo system

The invention is described in the following statement:

Technical Field

This invention concerns a distributed stereo audio system. Distributed stereo audio systems may be used to provide stereo sound to several rooms or areas from a single source of signal.

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Background Art

A typical stereo audio system comprises several signal sources such as a CD player and a tuner. The sources are generally housed in a unit together with an amplifier. In use, a signal from a selected source is amplified and provided to speakers which are typically located some distance away from the unit within the same room. The system controls are manually operable switches and dials on the signal sources and amplifier. There is sometimes a hand-held control device which is used to transmit infrared signals to the unit.

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In sophisticated systems the amplifier may drive several sets of speakers mounted, for instance, in different rooms throughout a house. Sometimes the amplifier will be provided with the switches to enable different sets of the speakers to be activated and deactivated.

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Summary of the Invention

The invention, as currently envisaged, is a distributed stereo audio system, including: two or more speakers for the broadcast of stereo audio signals; a source of stereo audio signals; a stereo amplifier to amplify stereo audio signals and drive the speakers; and a mains operated electrical power supply to provide power to the amplifier.

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The amplifier is located in the same room as the speakers, and remote from the signal source and power supply. The amplifier is connected to the signal source and power supply by means of a category 5 four pair twisted cable which provides, in respective twisted pairs, right channel audio signals from the signal source to the amplifier, left channel audio from the signal source to the amplifier, and DC power from the power supply to the amplifier.

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This system enables decentralisation of amplification, and permits the amplifier to be installed close to the speakers, reducing speaker cable loss and increasing total system damping factor.

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Amplifier and speaker sets in several rooms may receive signals from a single source of audio signals. Where the source provides a selection of components, such as radio or CD, it is also possible for different audio signals to be provided to different rooms. The volume may be set differently in each room.

The amplifier is based on an integrated circuit amplifier. As a result of not requiring a built-in power supply it may be compact, and it may be constructed to fit into a standard electrical light switch housing.

The amplifier output level may be controlled by the output level of the source components, or a manual volume control may be included with the amplifier. Alternatively, a hand-held remote control may be provided to provide volume control, among others things. In this case, the remote control may transmit infrared signals to a receiver mounted with the amplifier. Where the amplifier is mounted inside a standard electrical light fitting the fascia plate may include an infrared receiver. The fascia plate may also include status indicators for the amplifier and the audio signal source components.

Infrared signals received by the amplifier may be transmitted to the source components through a fourth twisted pair in the category 5 cable. The signals may be modulated before transmission to an infrared emitter which directly controls the audio components, or they may be demodulated and provided as data signals to those components.

The amplifier may accept standard line level signals from the audio source components, or speaker outlet of another amplifier. In other words, the amplifier may be driven by either a low impedance (4 to 16 ohm) speaker level signal, or a high impedance (10k ohm) line level signal. The amplifier may include a switchable muting system, and it may include an adjustable input level trim device.

A high input impedance at the amplifier will cause any inducted line signals to be conducted back to the lower impedance of the audio source, reducing induced system noise at the amplifier. High impedance will also allow many amplifiers to be run from a single audio source with no sonic detriment. Multiple pairs of speakers may be driven from a single audio source in this way without the need for speaker impedance matching devices.

The output from the amplifier is sufficient to drive a pair of hi-fi speakers, 4 to 16 ohm, at a reasonable sound level for most domestic requirements; typically 90-100dB unweighted. The amplifier does not require fused output protection.

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Brief Description of the Drawing

An example of the invention will now be described with reference to the accompanying schematic diagram.

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Best Modes for Carrying out the Invention

The distributed stereo audio system 1 comprises two speakers 2 and 3 connected to an amplifier 4. The amplifier 4 is housed in a standard electrical light switch housing in the same room as the speakers.

15 In another room, a source of audio signals 5 comprises a CD player 6, a tape recorder 7, a VCR 8 and a source selector 9. A power supply 10 provides power from the mains to each amplifier 4.

The amplifier 4 is connected to the signal source and power supply 10 by means of a category 5 four pair twisted cable 11. One of the twisted pairs 12 provides the right audio signal from the source to amplifier 4.
20 Another twisted pair 13 provides the left audio signal. A third twisted pair 14 provides regulated power from power supply 10 to the amplifier 4.

In use amplifier 4 amplifies the left and right standard line level signals and supplies them to the speakers 2 and 3 respectively. The amplifier is controlled by operation of a potentiometer 15 mounted on its fascia plate
25 16.

Amplification may also be controlled by means of a hand-held remote controller 17 which transmits infrared signals 18 to a receiver 19 mounted in fascia plate 16. The fascia plate may include displays indicating the status of the amplifier and, if required, the components of the source. The fascia plate
30 may also be used as a key-pad to transmit control commands to the sources.

Infrared signals may be transmitted, either before or after demodulation, from amplifier 4 back to source 5 using the fourth twisted pair 20 in category 5 cable 11. The infrared signals may be used to control the source directly. Alternatively, they may be used to retransmit the control
35 signals using transmitter 21 to an infrared receiver 22 associated with the source.

Amplifier 4 is designed around a single chip amplifier, and has high input impedance. This enables several amplifiers to be mounted in different rooms to amplify signals from the same source 5 for speaker sets in each of those rooms.

5 In each room the sound broadcast may be from the same component of the source, or from different components of the source. Further the amplification level may be different in each room.

 In the Underwriters Labs (UL) Level classification system, there are 5 levels of increasing quality cabling.

10 In work paralleling UL's efforts, the American National Standards Institute's (ANSI) Electronic Industry Association/Telecommunication Industry Association (EIA/TIA) has developed similar standards to rate UTP.

 The UL system is harmonised with the EIA/TIA category system, and UL categories 3-5 now correspond exactly to EIA/TIA 568A categories.

15 EIA/TIA 568A incorporates all of the relevant areas of 568, TSB-36, TSB-40A, and TSB-53. The standard covers 100 ohm UTP, 150 ohm STP, and fiber optic cabling. The EIA/TIA category rating system identifies categories 3, 4 and 5 for data applications.

20 Category 5 applies to UTP cables and associated connecting hardware with transmission characteristics up to 100mhz. Its application is ATM over copper TP-PMD 100Base-X.

 Most field test equipment verify category 5 conformance by checking the link's performance against EIA/TIA 568A Annex E requirements.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to
5 be considered in all respects as illustrative and not restrictive.

Dated this 14th day of August 1997

Leisure Tech Electronics Pty Limited
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Figure 1